

What is claimed is:

CLAIMS

1. A method of measuring the throughput of a network, comprising:
 - a) transmitting a block of data over the network;
 - b) measuring a value representative of the transmit time of the block;
 - 5 c) computing the data transmission rate of the block;
 - d) repeating steps a), b) and c) until a stop event occurs, wherein the stop event is the *first to occur of transmitting a number of blocks or the passage of an amount of time*; and
 - e) computing the network throughput by averaging the data transmission rates of selected ones of the blocks.
- 10 2. The method of claim 1 wherein the selected ones of the blocks consists of all of the blocks for which a data rate was computed during the measurement when the network is known to be a bursty network.
- 15 3. The method of claim 1 wherein the selected ones of the blocks consists of only those blocks for which the data rate was computed to be less than a prescribed amount from the average data transmission rates of all the blocks transmitted during the measurement when the network is known to be a non-bursty network.
- 20 4. The method of claim 1 wherein the size of a block of data is selected to fit within a network packet.
- 25 5. The method of claim 4 wherein the size of a block of data is selected to cause the application layer of a computer connected to the network to pass a message containing the block to the network without buffering delay.
- 30 6. The method of claim 5 wherein the transmit time is measured at the application programming layer of a computer connected to the network.
- 35 7. The method of claim 1 wherein transmitting a block of data comprises generating a message from an application program running on an operating system that establishes a socket having a buffer and the method additionally comprises setting the size of the socket buffer.

8. The method of claim 1 wherein the size of a block of data is less than 2 kilobytes.

9. The method of claim 1 wherein the throughput is measured in the upstream throughput and the method additionally comprises measuring the downstream throughput.

10. A method of measuring the throughput of a network, comprising:
a) establishing a connection between a user computer and a server;
b) presenting, with the server, a diagnostic web page to the user;
c) repetitively transmitting blocks of data over the network between the user computer and the server until a stop event occurs, wherein the stop event is the first to occur of transmitting a number of blocks or the passage of an amount of time;
d) measuring a value representative of the transmit time of the block; and
e) computing the network throughput by averaging the data transmission rates of selected ones of the blocks.

11. The method of claim 10 wherein the web page is presented to the user as an HTML page that contains a script that causes the user computer to transmit blocks of data to the server.

12. The method of claim 11 wherein the network is an ADSL network and the computed throughput represents the upstream throughput.

13. The method of claim 12 wherein the downstream throughput is separately measured.

14. The method of claim 11 wherein the HTML page additionally contains a test payload that is transmitted in the blocks of data.

15. The method of claim 10 wherein repetitively transmitting blocks of data wherein:
a) transmitting a block of data comprises transmitting a block from the server to the user computer; and

- b) the value representative of transmit time is derived from the time between successive acknowledgements from the user computer.

5 16. The method of claim 10 wherein the server is a diagnostic unit installed in the network.

17. The method of claim 10 additionally comprising:
- a) receiving a call from the network user at a call center operated by the network operator;
 - 10 b) directing the user to access the diagnostic web page and receiving the result;
 - c) receiving, for use at the call center, the computed network throughput.

15 18. The method of claim 10 wherein the passage of time is less than 10 seconds.

19. The method of claim 10 additionally comprising providing the computed throughput to a call center for an internet service provider.

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20. The method of claim 10 wherein the network is a nonbursty network and the selected ones of the blocks are selected based on the relationship between the transmit time of the block and the average transmit time of all other blocks.

25 21. A network configured for measuring throughput experienced by a user in the access portion of a network, comprising a diagnostic unit connected to the network, the diagnostic unit having programming that:

- a) presents a diagnostic web page to a user computer when the user accesses the diagnostic unit;
- 30 b) controls the repetitive transmission of blocks of data over the access network between the user computer and the diagnostic unit;
- c) measures a value representative of the transmit time of the block; and
- d) computes the network throughput by averaging the data
- 35 transmission rates of selected ones of the blocks received before a stop

event occurs, wherein the stop event is the first to occur of transmitting a number of blocks or the passage of an amount of time.

22. The network of claim 21 wherein the diagnostic unit is programmed to
5 measure throughput in the upstream and downstream directions.

23. The network of claim 22 wherein the diagnostic unit measures
downstream throughput by transmitting blocks of data to the user computer and
measures a value representative of time by measuring the time difference between
10 acknowledgement messages sent by the user computer.

24. The network of claim 23 wherein the diagnostic unit measures upstream
throughput by embedding code within the web page when presented to the user
computer, and that code causes the user computer to send successive blocks of data to
15 the diagnostic unit.

25. The network of claim 21 wherein the programming is an application
program running on an operating system and the operating system enables
communication over the network between the application program and the user
20 computer by establishing a socket that has a buffer and the application program
additionally comprises programming that sets the size of the socket buffer.

26. The network of claim 25 wherein the size of the socket buffer is set to
between 2Kbytes and 16Kbytes.
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27. The network of claim 26 wherein the size of the socket buffer is set to
between 8Kbytes and 12 Kbytes.